

WHAT IS CLAIMED IS:

1 1. A sensor package comprising:
2 a force sensing element having an element surface; and,
3 a housing having a housing surface, wherein the housing is arranged to
4 support the force sensing element so that the element surface and the housing surface
5 are substantially coplanar and so that the element surface of the force sensing element
6 directly senses a force without need of an actuator.

1 2. The sensor package of claim 1 wherein the sensing element has a
2 thickness, wherein the housing includes a well and a shelf, wherein the shelf supports
3 the sensing element within the well, and wherein the shelf has a depth with respect to
4 the thickness of the sensing element such that element surface protrudes above the
5 housing surface.

1 3. The sensor package of claim 1 wherein the sensing element has a
2 thickness, wherein the housing includes a well and a shelf, wherein the shelf supports
3 the sensing element within the well, and wherein the shelf has a depth with respect to
4 the thickness of the sensing element such that element surface is depressed with respect
5 to the housing surface.

1 4. The sensor package of claim 1 wherein the sensing element has a
2 thickness, wherein the housing includes a well and a shelf, wherein the shelf supports
3 the sensing element within the well, and wherein the shelf has a depth substantially
4 matching the thickness of the sensing element.

1 5. The sensor package of claim 4 wherein the housing has a connection
2 pad within the well, wherein the sensing element has a connection pad, and wherein
3 the connection pads of the housing and the sensing element are electrically coupled
4 together when the sensing element is supported by the shelf of the housing.

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1 6. The sensor package of claim 5 wherein a conductive adhesive
2 electrically couples the connection pads of the housing and the sensing element.

1 7. The sensor package of claim 6 further comprising a membrane
2 covering the surfaces of the housing and the sensing element in order to provide
3 electrical isolation of the sensor package.

1 8. The sensor package of claim 6 further comprising a membrane
2 covering the surfaces of the housing and the sensing element in order to provide
3 environmental protection for the sensor package.

1 9. The sensor package of claim 6 wherein the shelf has an adhesive
2 reservoir to hold the conductive adhesive.

1 10. The sensor package of claim 5 wherein the shelf is arranged to
2 prevent the conductive adhesive from migrating around an edge of the sensing element
3 and causing sensing element edge electrical shorting.

1 11. The sensor package of claim 1 wherein the housing has a
2 connection pad, wherein the sensing element has a connection pad, and wherein the
3 connection pads of the housing and the sensing element are electrically coupled together
4 when the sensing element is supported by the housing.

1 12. The sensor package of claim 11 wherein a conductive adhesive
2 electrically couples the connection pads of the housing and the sensing element.

1 13. The sensor package of claim 12 further comprising a membrane
2 covering the surfaces of the housing and the sensing element in order to provide
3 electrical isolation of the sensor package.

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1 14. The sensor package of claim 12 further comprising a membrane
2 covering the surfaces of the housing and the sensing element in order to provide
3 environmental protection for the sensor package.

1 15. The sensor package of claim 12 wherein the conductive adhesive
2 is held in an adhesive reservoir of the housing.

1 16. The sensor package of claim 1 further comprising a membrane
2 covering the surfaces of the housing and the sensing element in order to provide
3 electrical isolation of the sensor package.

1 17. The sensor package of claim 1 further comprising a membrane
2 covering the surfaces of the housing and the sensing element in order to provide
3 environmental protection for the sensor package.

1 18. A sensor package comprising:
2 a force sensing element having an element surface; and,
3 a housing having a housing surface, a well, and first and second shelves
4 within the well, wherein the first and second shelves of the housing are arranged to
5 support the force sensing element so that the element surface and the housing surface
6 are substantially coplanar and so that the element surface of the force sensing element
7 directly senses a force without need of an actuator.

1 19. The sensor package of claim 18 wherein the housing has a
2 connection pad within the well, wherein the sensing element has a connection pad, and
3 wherein the connection pads of the housing and the sensing element are electrically
4 coupled together when the sensing element is supported by the first and second shelves
5 of the housing.

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1 20. The sensor package of claim 19 wherein a conductive adhesive
2 electrically couples the connection pads of the housing and the sensing element.

1 21. The sensor package of claim 20 wherein the first and second shelves
2 are arranged to prevent the conductive adhesive from migrating around an edge of the
3 sensing element and causing sensing element edge electrical shorting.

1 22. The sensor package of claim 20 wherein the first and second
2 shelves each has an adhesive reservoir to hold the conductive adhesive.

1 23. The sensor package of claim 16 further comprising a membrane
2 covering the surfaces of the housing and the sensing element in order to provide
3 electrical isolation of the sensor package.

1 24. The sensor package of claim 16 further comprising a membrane
2 covering the surfaces of the housing and the sensing element in order to provide
3 environmental protection for the sensor package.

1 25. A method of packaging a force sensing element having an element
2 surface comprising the following steps:

3 a) applying the force sensing element to a housing having a housing
4 surface so that the element surface and the housing surface are substantially coplanar;
5 and,

6 b) attaching the force sensing element to the housing.

1 26. The method of claim 25 wherein the force sensing element has a
2 thickness, wherein the housing includes a well and a shelf, wherein the shelf has a
3 depth substantially matching the thickness of the force sensing element, and wherein
4 step a) comprises the step of applying the force sensing element to the housing so that
5 the shelf supports the force sensing element within the well.

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1 27. The method of claim 25 wherein the housing has a connection pad,
2 wherein the force sensing element has a connection pad, and wherein step b) comprises
3 the step of adhesively binding the connection pads of the housing and the force sensing
4 element together so that the force sensing element is attached to the housing and so that
5 the connection pads of the housing and the force sensing element are electrically
6 coupled together.

1 28. The method of claim 25 further comprising the step of covering
2 the surfaces of the housing and the force sensing element with a membrane in order to
3 provide electrical isolation of the force sensing element.

1 29. The method of claim 25 further comprising the step of covering
2 the surfaces of the housing and the sensing element with a membrane in order to
3 provide environmental protection for the force sensing element.

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